HAPTIC ROCKER BUTTON FOR VISUALLY IMPAIRED OPERATORS

BACKGROUND

[0001] Embodiments of the inventive subject matter generally relate to the field of data displays for the blind and visually impaired, and, more particularly, to haptic technology for displaying Braille on mobile devices.

[0002] Mobile devices such as cell phones, smart phones, and PDAs generally present data in a text format. The text format can be text messages, web pages, and emails. Users of mobile devices generally read text vertically and horizontally, and users can generally scroll vertically and horizontally through the text as needed. Mobile devices can have no display or input capabilities for the blind or visually impaired, and when such capabilities are included in mobile devices, these capabilities are very limited for visually impaired or blind operators.

[0003] Haptic displays are bendable/formable/malleable surfaces that can be shaped by mechanicals, air pressure, and/or magnetic liquids. Thus, shapes, buttons, letters, numbers, and the like can be displayed in haptic text.

SUMMARY

[0004] Embodiments of the inventive subject matter include a method for converting text to Braille content and presenting the Braille content on a haptic rocker button. In some embodiments, the method includes receiving data in a mobile device, converting the data to Braille content, displaying at least a portion of the Braille content with a haptic rocker button, and controlling a horizontal movement of the displayed Braille content in the haptic rocker button.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The present embodiments may be better understood, and numerous objects, features, and advantages made apparent to those skilled in the art by referencing the accompanying drawings.

[0006] FIG. **1** depicts a plan view of a mobile phone utilizing a haptic rocker button according to an embodiment of the invention.

[0007] FIG. **2** depicts an end view of a mobile phone utilizing a haptic rocker button in a neutral position.

[0008] FIG. **3** depicts an end view of a mobile phone utilizing a haptic rocker button with a hand contacting a left side of the haptic rocker button.

[0009] FIG. **4** depicts a block diagram of an embodiment of a device in accordance with the invention.

[0010] FIG. **5** depicts a flow diagram of an embodiment of the method.

[0011] FIG. **6** depicts a flow diagram of a method for the step of controlling a horizontal movement of the Braille content displayed in a haptic rocker button.

[0012] FIG. **7** depicts a flow diagram of another method for the step of controlling a horizontal movement of the Braille content displayed in a haptic rocker button.

[0013] FIG. **8** depicts a schematic diagram of a computer system in an embodiment of the invention.

DESCRIPTION OF EMBODIMENT(S)

[0014] The description that follows includes exemplary devices, methods, memory, systems, techniques, instruction sequences and computer program products that embody techniques of the present inventive subject matter. However, it should be understood that the described embodiments may be practiced without these specific details. Well-known instruction instances, protocols, structures and techniques have not been shown in detail in order not to obfuscate the description.

[0015] The inventive subject matter includes devices, methods, memory, and systems utilizing haptic technology. The haptic technology can be used in conjunction with mobile devices, such as but not limited to mobile phones. The haptic technology allows visually impaired or blind individuals to interpret data normally found in mobile devices by haptically communicating the data in Braille patterns. A haptic rocker button displays the Braille patterns to visually impaired or blind individuals, and the haptic rocker button allows said individuals to control horizontal movement of the Braille displayed in the haptic rocker button.

[0016] Embodiments of the method are shown in the figures and discussed below, and it should be understood the operations as presented are exemplary and some operations may be substituted, added, rearranged or removed while still encompassing inventive subject matter. Moreover, it should be understood the order of operations is not to be limited unless explicitly specified herein.

[0017] As will be appreciated by one skilled in the art, aspects of the present inventive subject matter may be embodied as a system, method or computer program product. Accordingly, aspects of the present inventive subject matter may take the form of an entirely hardware embodiment, an entirely software embodiment (including firmware, resident software, micro-code, etc.) or an embodiment combining software and hardware aspects that may all generally be referred to herein as a "circuit," "module" or "system." Furthermore, aspects of the present inventive subject matter may take the form of a computer program product embodied in one or more computer readable medium(s) having computer readable program code embodied thereon.

[0018] Any combination of one or more computer readable medium(s) may be utilized. The computer readable medium may be a computer readable signal medium or a computer readable storage medium. A computer readable storage medium may be, for example, but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, or device, or any suitable combination of the foregoing. More specific examples (a non-exhaustive list) of the computer readable storage medium would include the following: an electrical connection having one or more wires, a portable computer diskette, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), an optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage device, a magnetic storage device, or any suitable combination of the foregoing. In the context of this document, a computer readable storage medium may be any tangible medium that can contain, or store a program for use by or in connection with an instruction execution system, apparatus, or device.

[0019] A computer readable signal medium may include a propagated data signal with computer readable program code embodied therein, for example, in baseband or as part of a carrier wave. Such a propagated signal may take any of a variety of forms, including, but not limited to, electro-magnetic, optical, or any suitable combination thereof. A computer readable signal medium may be any computer readable